TEST NODE BRIEFING
Technical information relating to the SamKnows test nodes

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1 Important Notice

IMPORTANT NOTICE

Nothing in this document is intended to nor will create any binding obligation on SamKnows.

2 SamKnows Test Nodes

In order to gauge a user's broadband performance, the SamKnows Whiteboxes need something to test against. SamKnows maintains a fleet of "test nodes" for precisely this purpose; these are the servers that the Whiteboxes run their measurements to.

The test nodes run special software designed specifically for measuring the network performance when communicating with the Whiteboxes.

It is critical that test nodes be deployed near to the customer (and their Whitebox). This is essential because the further the test node is from the customer, the higher the latency and the more third party networks that must be traversed. This is why SamKnows operates so many test nodes all around the world - locality to the customer is critical.

2.1 Test node specifications

All test nodes must meet the following minimum specifications:

- Dual core Xeon (2GHz+)
- 4GB RAM
- 80GB disk
- Gigabit Ethernet connectivity, with gigabit upstream link
- CentOS/RHEL 5.x/6.x

We require multiple TCP and UDP ports to be open on the test node for the Whiteboxes to run their tests. The test nodes must also respond to ICMP ping requests. Additional open ports may be required if new tests are added to the SamKnows project.

Good network connectivity is key, due to the likelihood multiple clients running tests simultaneously. Dual gigabit links are preferable.

2.2 Test node capacity

The capacity of a test node is dependent on the bandwidth used, and not on the number of units testing against it.

The maximum capacity of a test node is 1000 Mbps concurrent throughput.

The configuration used by SamKnows for the FCC Measuring Broadband America project comfortably supports 1500 users, assuming an average broadband product of ~15 Mbps.

If for example the testing frequency per unit is halved, twice as many units can be supported on the test node.

2.3 Data that is stored on test nodes

No measurement data is stored on test nodes. The test nodes provide a 'dumb' endpoint for the Whiteboxes to test against. All results are recorded by the Whiteboxes alone, and then transmitted to SamKnows.

2.4 Test node selection

The SamKnows Whiteboxes select the nearest node by running round-trip latency checks to all servers before measurement begins. This means that we are always testing against the server nearest to us in network terms, which will not necessarily always be the one nearest geographically.

2.5 On-net versus off-net

It is important that we measure ISPs on a like-for-like basis. This means running measurements to a consistent set of targets (test nodes) that do not favour one ISP over another. This necessitates having the test nodes sit outside of the ISPs' networks. These are called 'off-net' servers, because they reside 'off the ISP network'.

However, it is also very useful to have test nodes inside the ISP network ('on-net servers'). This allows us to:

- Determine what degradation in performance occurs when traffic leaves the ISP network; and
- Check that the off-net servers are performing as well as we expect.

By having both on-net and off-net measurement data for each Whitebox, we can have a great deal of certainty over the quality of the data.

2.6 Test node provisioning

SamKnows would like to see test nodes in every major city of every country! Until then, SamKnows is has a policy of accepting test nodes provided by network operators, providing that;

- The servers meet the specifications outlined earlier
- Minimum of 1Gbps upstream is provided
- The test node does not reside in an ISP network, or, if it does, it has direct connectivity to other ISPs and national peering locations

If you wish to provide a test node please contact nodesupport@samknows.com

3 Current locations

The following cities currently have SamKnows test nodes installed. Please note that in many locations there are multiple servers installed, connected to different network operators.

North America		
Atlanta, US	Washington DC, US	Miami, US
New York, US	Chicago, US	Mountain View, US
Dallas Fort Worth, US	Seattle, US	
South America		
Natal, Brazil	Paraiba, Brazil	Uberlandia, Brazil
Rio de Jaeiro, Brazil	Sao Paolo, Brazil	Brasilia, Brazil
Europe		
London, UK	Bromley, UK	Manchester, UK
Paris, France	Hamburg, Germany	Frankfurt, Germany
Amsterdam, Netherlands	Oslo, Norway	Stockholm, Sweden
Madrid, Spain	Turin, Italy	Rome, Italy
Athens, Greece	Warsaw, Poland	Gdansk, Poland
Riga, Latvia	Zagreb, Croatia	Bucharest, Romania
Asia		
Shanghai, China	Tokyo, Japan	Singapore, Singapore
Australasia		
Sydney, Australia	Wellington, New Zealand	

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